

REMARKS

The rejection of apparatus claims 35,-43, 45-57 and 60 under 35 U.S.C. §112, 1 has been rendered moot by the cancellation of the apparatus claims.

Likewise, the rejection of Claims 45, 53-55, 58 and 59 under 35 U.S.C. §112, 2 has been, in part, rendered moot and, with regard to the method claims, addressed in reformatted method claims 61-71.

The rejections of Claims 35, 37, 42, 43, 53-55, 57 and 60 as being anticipated by DE '592 under 35 U.S.C. §102(b), of Claim 56 as being unpatentable over DE '592 in view of Tateshi or Moslehi under 35 U.S.C. §103(a), of claims 38-41 as being unpatentable over DE '592 in view of Yaminiski, of Claims 51 and 52 as being unpatentable over DE '592 in view of JP '237 under 35 U.S.C. §103(a), of Claims 35-43, 46-50 and 53-57 as being unpatentable over JP '568 in view of JP '568 in view of JP '237 under 35 U.S.C. §1.3(a) are also rendered moot by the cancellation of those claims. Thus, no further remarks are directed thereto.

The rejection of Claims 58 and 59 as being unpatentable over Lamont in view of Kogan under 35 U.S.C. §103(a) is, however, traversed. Reconsideration of that rejection is respectfully requested in light of the submission of the new method claims and the following comments.

The method claimed in this application is directed to manufacturing a coated circular substrate with a single inclined magnetron sputtering source, a specific intersection angle between first and second central axes of that source,

rotation of the one or more substrates and selecting the diameter of the circular area, and thus of the substrate diameter, to be larger than the diameter of the source.

Assuming for argument's sake only, that the teachings of Lamont and Kogan would have been combinable without the exercise of hindsight or inventive skill, the resultant hypothetical method would have used an intersection angle of only 10° to 45° , preferably 30° , but have a substrate surface that is substantially smaller than the sputtering surface. Although the Kogan patent does teach the holding of a large wafer, there is no teaching whatsoever concerning the coating process itself or the use of an inclined magnetron-to-substrate arrangement so as to provide a motivation to make the hypothetical combination. The motivation suggested at page 19 of the Office Action is not one supplied by either Lamont or Kogan, but rather the result of impermissible hindsight. It is the prior art references themselves that must suggest the motivation.

The applicants have found with their claimed method that they can achieve an increased coating rate and a layer thickness homogeneity which is even better than that achieved by known sputtering chambers. Because there is applied only one single sputtering source, the method is significantly less costly with respect to the plant to be used than when two sputter sources are used. Use of a single sputtering source, with its advantage of less expense, nevertheless

makes homogenous layer deposition more critical because there is a significant asymmetry of the source-to substrate arrangement.

Applicants thus also discovered the importance of establishing a critical relatively narrow range for the intersection angle of the two central axes together with rotation of the substrate. A further significant advantage of the claimed method is that, contrary to most prior art magnetron sputtering techniques, the surface of the substrate to be coated is selected larger than the surface of the sputtering source. This is again a significant advantage because the sputtering source can now be of a reduced diameter and thereby significantly lower manufacturing costs of the coated substrate.

In other words, the purported hypothetical combination of Lamont and Kogan does not set forth a prima facie case of obviousness based upon substantial record evidence. Instead, the combination is based upon impermissible hindsight and motivation not found in either document or in the other documents applied against the cancelled claims.

For example, DE '592 teaches only that the intersection angle of the two axes is not critical inasmuch as it can be between 0° and 90° , with an intersection angle α of about 30° in Fig. 1. No rotation of the substrate is suggested. Fig. 1 might speculatively show that the substrate as being somehow larger than the sputtering surface but no comment is made with regard to such feature throughout the written description. This document does not teach

selecting the intersection angle to rotate the substrate, the surface of the substrate being selected to be larger than that of the sputtering source or applying a single magnetron source to achieve a homogenous thickness distribution along the substrate at a high coating rate.

The Yamanishi patent teaches twin inclined arrangements to more easily solve the problem of coating thickness homogeneity due to symmetric arrangement of the multiple magnetron sources with respect to the substrate. This makes apparatus significantly more expensive than one using a single magnetron source as in the invention claimed herein. Indeed, the use of symmetric multiple magnetron arrangements, as in the Yamanishi patent, makes the selection of the intersection angle of the two magnetron axes and the substrate axis less critical, in fact of no concern in such an arrangement.

JP '237 does not appear to teach a magnetron source at all but rather a collimator arrangement to homogenize sputtering direction on the inclined substrate. A collimator will not improve homogeneity of coating deposition.

JP '568 teaches an intersection angle of 60° to 90° and, does not teach rotating the substrate. Moreover, the substrate is considerable smaller than the sputtering source.

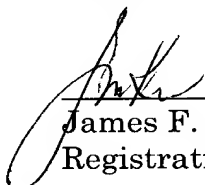
For the foregoing reasons, early and favorable action is earnestly solicited. To the extent that any issues remain, the Examiner is requested to contact the undersigned before any additional written communication so that prosecution may be expedited by a telephonic or personal interview.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #08031048561).

Respectfully submitted,

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